MicroLink® ADSL Modem Router

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Preface

Thank you for placing your trust in this devolo product.

With the MicroLink ADSL Modem Router, you have purchased an ADSL router that combines the functions and advantages of an ADSL modem, a switch (hub) and a router in a single device. This combination makes it the optimal, user-friendly network and Internet access solution for small-office and home-office (SOHO) environments.

- The router's ADSL modem provides satisfyingly fast Internet access:
  - Download speeds of up to 8 Mbps make transferring video material, graphics and other high-volume data a pleasure.
  - With upload speeds of up to 1 Mbps, you can easily send large e-mail attachments quickly and at low cost.
- It also serves as an optimal combination of Internet-access router and network switch:
  - The router simplifies the installation of Internet access significantly, as no special drivers are required for the connected individual computers. The access protocol has been implemented in the router itself.
  - The router functionality lets multiple users access the Internet at the same time. NAT and firewall functions protect your local network against intruders. DHCP automates the TCP/IP configuration of the connected computers. The router can be configured conveniently using a Web browser.
  - The integrated switch is the foundation for small networks. Up to four computers can be connected simultaneously. Each of the four ports can also be used as an uplink port to connect additional routers, switches or hubs.

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About this manual

Exacting manufacturing standards and stringent quality control are the basis for high product standards and consistent quality to ensure your fullest satisfaction with this MicroLink ADSL Modem Router.

This documentation was compiled by several members of our staff from a variety of departments in order to ensure you the best possible support when using your product.

For further information, please visit 'www.devolo.com'

Our online services (www.devolo.com) are available to you around the clock should you have any queries or require any further support.

Package contents

Please ensure that the delivery is complete before beginning with the installation of your router:

- MicroLink ADSL Modem Router
- AC adapter
- ADSL cable
- 2 clips for stacking various devolo products
- CD ROM with manual and software
- printed manual

devolo AG reserves the right to change the package contents without prior notice.

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Content

1 Introduction 6
1.1 What is ADSL? 6
1.2 What does the MicroLink ADSL Modem Router have to offer? ... 7

2 Connection and installation 8
2.1 Display and connections 8
2.2 Connecting the MicroLink ADSL Modem Router 9
2.3 Networking examples 11

3 Router configuration 12
3.1 Setting up Internet access using the setup wizard 12
3.2 Setting up Internet access manually 13
3.3 Advanced configuration 14
3.3.1 Description of the buttons 15
3.3.2 Starting the advanced configuration 15
3.3.3 Main menu 16
3.3.4 Setup 17
3.3.5 Status 25
3.3.6 Tools 27
3.3.7 Advanced 30

4 Appendix 37
4.1 Performance data and specifications 37
4.2 Care and maintenance of the device 38
4.3 CE conformity 38
4.4 Declaration of conformity 39
4.5 Warranty conditions 40

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1 Introduction

1.1 What is ADSL?

The sheer speed of development of computer technology over the last few years has resulted in a huge increase in the volume of electronic data traffic. More users every day want to send and receive a constantly increasing volume of data. Conventional transmission technologies (analog modems or ISDN devices) are no longer equal to the demand.

New technologies are eliminating the restrictions and are offering the user true broadband communications at significantly higher transfer speeds. An important criterion for the spread of these access technologies is their availability in as many offices and private households as possible. One of the technologies is transfer by ADSL, which bridges the section of the network that connects to the customer ("the last mile") over standard copper wires. ADSL can thus be used for broadband access to the Internet, for example.

ADSL technology (**A**symmetric **D**igital **S**ubscriber **L**ine) uses three regions of different sizes on the copper wire of a standard telephone line. Two regions are used for data transmission and one for telephoning. The term 'Asymmetric' indicates that the transmitting and receiving channels can carry different quantities of data:

- When the user surfs the Internet, the data sent to the Internet Service Provider (ISP) tend to carry less information (e.g. addresses of web sites or e-mails). The transmission rate of up to 1 Mbps is generally sufficient for this purpose.
- To load multimedia content (video sequences, animations, images etc.) onto the computer from the Internet at acceptable quality and speed, a transmission rate of up to 8 Mbps brings a significant saving in cost and time.

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1.2 What does the MicroLink ADSL Modem Router have to offer?

The following is an outline of the principal features of the device giving you a quick overview of its capabilities.

Simple installation

- Connect the MicroLink ADSL Modem Router to the power outlet
- Connect the MicroLink ADSL Modem Router to the computers in your LAN
- Connect the MicroLink ADSL Modem Router to the ADSL line using the ADSL cable
- Configure Internet access using the setup wizard
- Done!

ADSL operation

- Access the Internet and use the telephone at the same time
- No new wiring, because the existing telephone lines (copper wire) can still be used
- High transmission rates of up to 8 Mbps (download) or up to 1 Mbps (upload)

Status display

The control lamps (LEDs) at the front of your device display the router status, and provide status regarding the function of the data transmission.

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2 Connection and installation

This chapter explains the display and connections of the MicroLink ADSL Modem Router and shows you how to set up the device and connect computers as well as other network devices. Two network examples are illustrated at the end of the chapter.

2.1 Display and connections

Power	Power supply.
Link	WAN connection; lit when a connection exists to the Internet access device. Flashes during training.
Connect	Lit when an active point-to-point connection exists.
Data	Lit during data transfers.
Ports 1 ... 4	Connections for up to four computers or switches (hubs) in LAN.
Link/Act	Link = connection, Act = activity. Lit when a computer (or hub/switch) is connected. Flashes during data transfers.
FD/Col	FD = Full Duplex, Col = Collisions. Lit during full duplex operation. Flashes during data collisions.
10/100	10/100 = 10 or 100 Mbps. Lit when data transfer rate is 100 Mbps.
	Button for manual reset. If this button is pressed for longer than one second, all of the stored configuration data will be deleted and the router will be restored to its factory defaults.

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	RJ11 socket for ADSL cable (at least UTP CAT3, preferably UTP CAT5) to Internet access device.
	RJ45 sockets for network cables (patch cables, at least UTP CAT5) to connect computers in the LAN or additional switches.
	Connection for AC adapter.
	Power switch.

2.2 Connecting the MicroLink ADSL Modem Router

Preconditions

To work with your MicroLink ADSL Modem Router, you need at least one network cable with RJ45 plugs (also known as a patch cable) of the type UTP-CAT5 (**U**nshielded **T**wisted **P**air, Category 5) and a computer that meets the following preconditions:

- Network-enabled operating system with a Web browser, such as Windows 98, Windows Me, Windows 2000, Windows XP, Linux, MAC OS X
- Ethernet port (RJ45)

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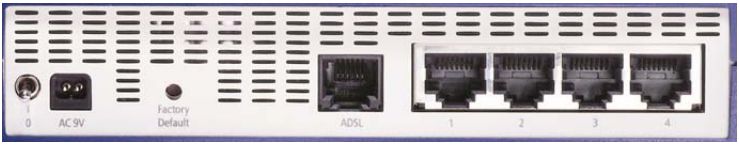
① Connect the device to an AC outlet using the AC adapter. Turn on the power with the microswitch on the back. The blue 'Power' LED on the front panel will light up.

② Connect the ADSL cable to the socket on your 'ADSL' router and to the ADSL connection.

If necessary, connect your Internet service provider's ADSL connection device to your telephone socket using a telephone connection cable. The 'ADSL Link' LED will light up after several seconds.

③ Next, use a network cable to connect a computer to one of the router's RJ-45 sockets (e.g. '1') and start the computer. The 'Link/Act' LED will light up.



It is important to always start the router before the computers so that the computers can receive their address configuration from the router while booting.

④ You may also connect additional computers or switches to ports '2' to '4' now or at a later date.

As each of the ports also functions as an uplink port, you may connect either a computer or an additional switch (hub) to any of the 4 ports, should you need to link more than 4 computers. Thanks to autosensing, you can use either crossover or normal twisted-pair cables. A blue LED labeled 'Link/Act' will be lit on the front panel for every computer or switch (hub) which is connected and powered up.

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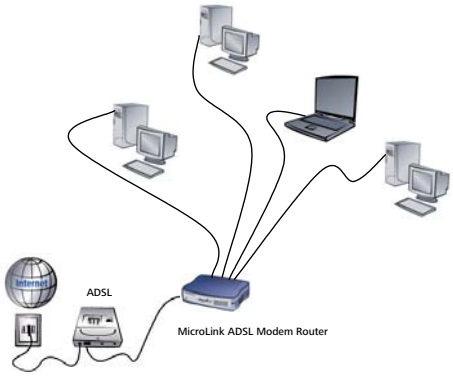
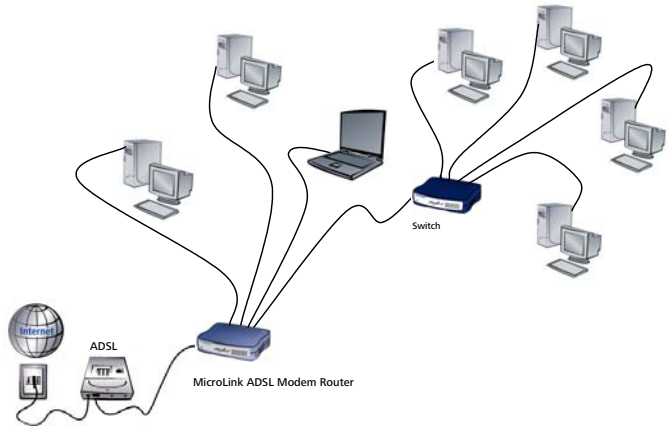
2.3 Networking examples

① Networking of multiple workstations; Internet access via the MicroLink ADSL Modem Router



② Linking of two subnetworks using a switch; Internet access via the MicroLink ADSL Modem Router



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3 Router configuration

This chapter will explain how to set up Internet access and how to take advantage of additional functions and settings of your router with advanced configuration.

The configuration of the MicroLink ADSL Modem Router can be broken down into the following steps:

- Check and configure the DHCP parameters and a number of other settings of the computers in the network
- Set up Internet access
- Configure additional router functions

We recommend using the setup wizard to configure the DHCP parameters and set up Internet access. It will assist you with the most important settings and make suggestions for the required configuration steps ("Setting up Internet access using the setup wizard" on page 12).

Alternatively, you may also set up Internet access using browser-based configuration ("Setting up Internet access manually" on page 13).

The additional functions of the router must be set up manually using the browser-based configuration ("Advanced configuration" on page 14).

If you have switched the router's power off and back on, or reset the router using the 'Factory Default' switch or settings dialogs, you must then also restart all of the connected computers to update the TCP/IP information.

3.1 Setting up Internet access using the setup wizard

If you are using a computer with a Windows operating system to configure the router, you have the option of using the setup wizard.

① Put the enclosed devolo product CD in your CD-ROM drive. The 'devolo MicroLink ADSL Modem Router' setup application will start automatically.

If it does not start automatically, run the file 'autorun.exe' in the root folder of the product CD.

② In the CD setup select 'Install MicroLink ADSL Modem Router'..

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③ The wizard will now install the selected devolo software on your computer. When the installation is complete, the router configuration wizard will automatically start. Initially, it will check your computer's DHCP settings and adjust them as necessary. Once this is complete, it will assist you in setting up Internet access for the router.

④ Finally, the wizard will contact the devolo website to ensure that Internet access is working. If the Internet connection is working correctly, configure all other connected computers. Insert the devolo product CD in the computers to be configured and install 'MicroLink ADSL Modem Router Installation' as a minimum. The wizard will then check the settings of the operating system and correct them as necessary, and will skip setting up Internet access if so requested.

3.2 Setting up Internet access manually

You will also have the option of setting up the router manually if you cannot use the setup wizard—if you are not using Windows as your operating system, for example.

The computer you are using to configure the MicroLink ADSL Modem Router must be set up to receive DHCP information automatically. For further information, please see the documentation of your operating system.

① Open your browser and enter the URL 'http://192.168.0.253'.

② Enter the default username and password 'admin' and 'password'.

③ If you have not yet configured Internet access, a list will now be displayed of the countries in which you can operate the MicroLink ADSL Modem Router. Select your location from the country list and click **Next >>**.

The sample provider list illustrated here is for Germany. Further provider lists are available with providers relevant to other countries.

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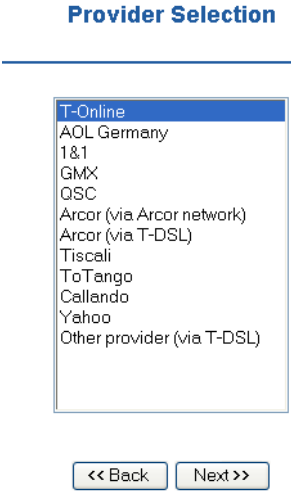
④ Choose your ADSL provider from the list and confirm your choice by clicking **Next**.



*If you are using an **unlisted** provider, select the entry 'Other provider (via T-DSL)' and set up the connection manually.*

⑤ Enter your access information (username, password) and click **Next**.

*Keep in mind that the settings you have configured only take effect if you confirm them under 'Save Settings' by clicking **Save**. This will restart the MicroLink ADSL Modem Router.*

⑥ Finally, check whether the Internet connection works by entering a URL such as www.devolo.com in your Web browser (e.g. Internet Explorer). Once your Internet access is working correctly, set the remaining connected computers to automatically receive DHCP information. For further information, please see the documentation of your operating system.

3.3 Advanced configuration

In this chapter, we will be guiding you through the advanced configuration of the MicroLink ADSL Modem Router, explaining its functions and settings.

If you have any questions regarding the terms used here or the deployment scenarios, please see at www.devolo.com.

Please note that using the setup wizard will delete all of the settings you have made in the advanced configuration.

3.3.1 Description of the buttons

This section provides a brief description of the buttons used in the configuration interface. Individual buttons related to specific configuration menus are covered in the descriptions of the relevant menus.

All of your changes to the configuration will be temporarily saved on the individual configuration pages. These changes do not affect the router immediately.

This button will take you to the next configuration page.

All of the changes you have made to the configuration on this page will be reset to their original settings. These changes do not affect the router immediately.

*Keep in mind that the settings you have configured only take effect if you confirm them under 'Save Settings' by clicking **Save**.*

3.3.2 Starting the advanced configuration

① Open your browser, enter the URL 'http://192.168.0.253', as well as the default username and password 'admin' and 'password'.

② Click 'Advanced Configuration' and **Next >>**.

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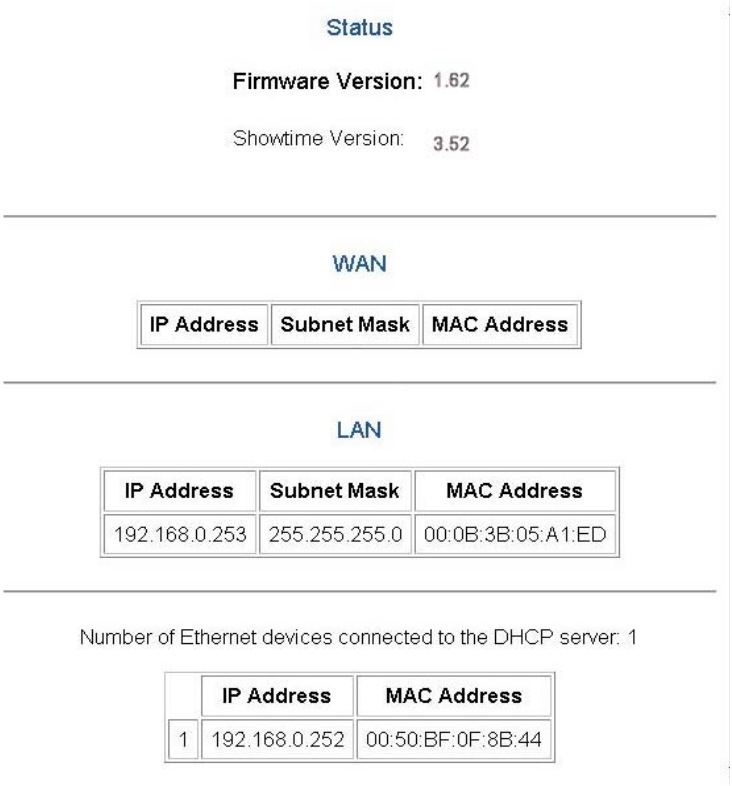
3.3.3 Main menu

Status

'Status' provides an overview of general settings.



The default language setting for the menus is based on the language version of your web browser. In addition, the menu language (German/English) can be toggled by clicking the corresponding flags found on the start page of the configuration interface.

The MAC address (Media Access Control) is a serial number and unique. It is programmed into the hardware and cannot be changed. The router has three MAC addresses; one for the local cabled network (LAN) and one for the Internet (WAN). The MAC addresses for the LAN and WAN can be taken from the configuration software.

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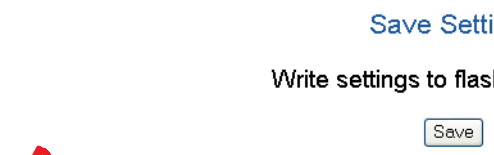
Save Settings

Here you can save all of the settings you have changed.

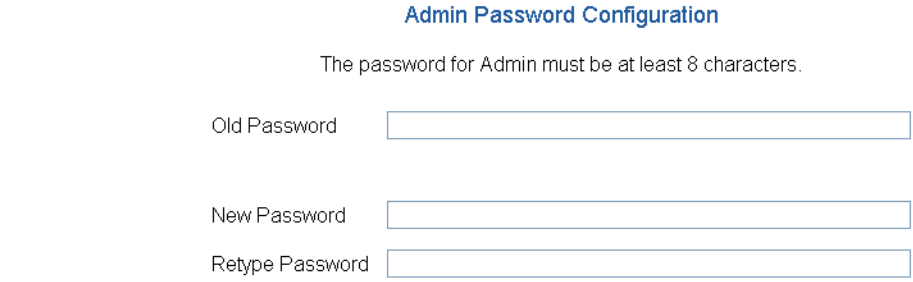


*Keep in mind that the settings you have configured only take effect if you confirm them under 'Save Settings' by clicking **Save**.*

3.3.4 Setup

Admin Password

Specify the password here.



Select a new password to prevent unauthorized access to the configuration of your router. Enter it into both fields. You also enter your old password.

*The password must be at least 8 characters long. Should you ever forget your password, you will need to press the 'Factory Default' button. However, this will also delete all of your configuration data. You will then need to set up the router again. The factory-default administrator password is 'password'. Save your new password by clicking **Submit**.*

*Keep in mind that the settings you have configured only take effect if you confirm them under 'Save Settings' by clicking **Save**.*

Please note that changing the administrator password will disable the setup wizard. To use the setup wizard, restore the password to its default setting, 'password'.

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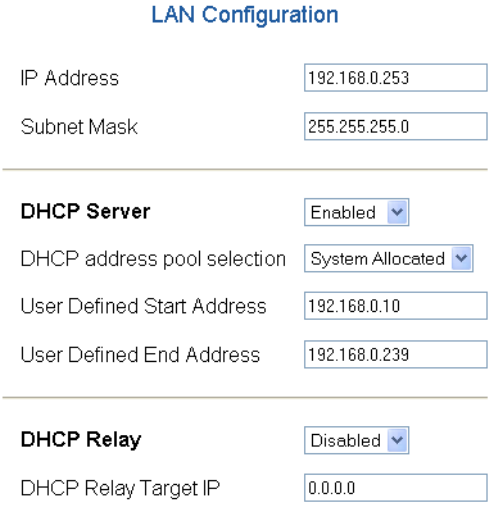
LAN

Define the settings for the local network under 'LAN'.



- 'IP Address': By default the MicroLink ADSL Modem Router has the IP address '192.168.0.253'. This address can be changed as required for your local network.

Please note that changing the IP address will disable the setup wizard. The setup wizard can only be used if the MicroLink ADSL Modem Router can be reached at its default IP address of '192.186.0.253' with the subnet mask '255.255.255.0'.

- 'Subnet Mask': The subnet mask is assigned with the IP address and specifies the address range. By default, the MicroLink ADSL Modem Router has the subnet mask '255.255.255.0'. This address can be changed as required for your local network.
- 'DHCP Server': Select 'Enabled' to enable the DHCP server and assign IP addresses dynamically; select 'Disabled' to disable the DHCP server and assign static IP and gateway addresses manually.
  - 'DHCP address pool selection': Select 'System Allocated' to automatically assign an IP address from your IP address pool; select 'User Defined' to assign an IP address manually.
  - 'User Defined Start Address': When working with a user-defined DHCP address pool, enter the IP start address manually.

- 'User Defined End Address': When working with a user-defined DHCP address pool, enter the IP end address manually.

- 'DHCP Relay': If this function is enabled, the router will serve as a relay and forward DHCP queries to the DHCP server.
  - 'DHCP Relay Target IP': Enter the IP address of the DHCP server here if the router is to be used as a relay.

The router can always perform only one function, i.e. either as a server or relay.

Please note that disabling the DHCP server will disable the setup wizard. The setup wizard can only be used if the MicroLink ADSL Modem Router is set up as the DHCP server for the LAN.

WAN

Wide-area network settings can be defined under 'WAN'. The configuration corresponds to your Internet access settings.

*If you set up your Internet access using the setup wizard, and only plan to execute standard applications with the MicroLink ADSL Modem Router, the entries on this screen do **not** need to be modified manually. Most of the functions listed here, which are optimally and automatically configured by the*

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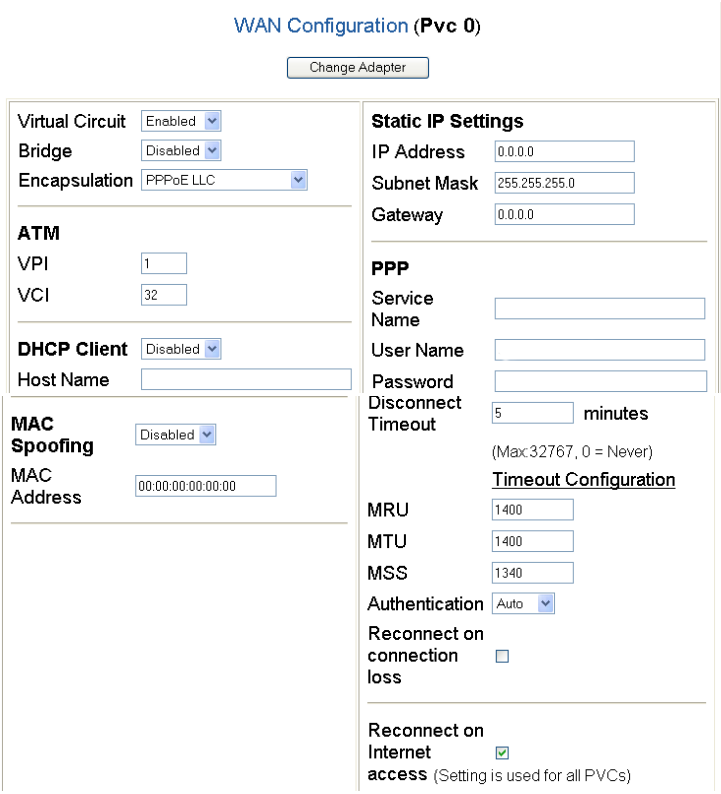
wizard, are provider-specific. For setting up your Internet access, please refer to "Setting up Internet access using the setup wizard" on page 12.



- 'PVC': A variety of PVCs can be set and configured individually under **Change Adapter**.

Please note that your Internet provider must support multiple PVCs (permanent virtual channels) for you to use this feature.

- 'VC' (Virtual Circuit): The current PVC can be enabled and disabled.
- 'Bridge': If this function is enabled, the selected PC can be linked to the bridge.
- 'Encapsulation': Protocol selection list containing the usual provider protocols.
- 'ATM' is a connection-oriented data communications process.

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- 'VPI', 'VCI' are data about your Internet connection, which you obtain from your ISP.

- 'DHCP Client': WAN-side; can be enabled and disabled.
  - 'Host Name': This is the name that the router sends the DHCP server when making DHCP queries.
- 'MAC Spoofing': WAN-side 'MAC Address'; can be entered manually.

The MAC address (Media Access Control) is a serial number and unique. It is programmed into the hardware and cannot be changed. The router has three MAC addresses; one for the local cabled network (LAN) and one for the Internet (WAN). The MAC addresses for the LAN and WAN can be taken from the configuration software.

- 'Static IP Settings': Whether you work with dynamic or static IP addresses depends on your agreement with your ISP. Normally, IP addresses are assigned dynamically, i.e. a new one is assigned each time you connect.
  - 'IP Address', 'Gateway' and 'Subnet Mask' are data about your Internet connection, which you obtain from your ISP.
- 'PPP' is a connection protocol.
  - 'Service Name', 'User Name', 'Password' are data about your Internet connection, which you obtain from your ISP.
  - 'Disconnect Timeout': This function (default setting: '5') lets you set a time limit so that you can control your connection charges and reduce costs based on time. If the router does not receive any data packets for the amount of time specified by the idle time setting, it automatically disconnects from the Internet server. As soon as it receives a request to connect after disconnecting automatically, it automatically reestablishes a connection (if you have enabled the option 'Reconnect on Internet access').

The 'Timeout Configuration' link will take you directly to the 'PPP Disconnect Timeout'. For more information go to the section "Advanced configuration" on page 14.

In the interests of cost control, ensure that you do not have Internet services such as e-mail clients, file sharing services or news tickers enabled in your local network, as these will periodically access the Internet. If you have flat-rate service from your Internet provider (unlimited online time without additional charges), you obviously do not have to worry about such "inadvertent" connections to the Internet.

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- 'MRU': Maximum Receive Unit; maximum size for incoming packets
- 'MTU': Maximum Transmit Unit; maximum size for outgoing packets
- 'MSS': Maximum Segment Size; maximum payload for TCP packets
- 'Authentication': desired authentication method
- 'Reconnect on connection loss': Internet providers generally interrupt the connection every 24 hours, resulting in a new IP address being assigned to the router. The MicroLink ADSL Modem Router can automatically reestablish the connection in such cases.

The 'Reconnect on connection loss' function is disabled by default.

- 'Reconnect on Internet access': If you check this function, an Internet connection is automatically established whenever an application tries to send a data packet to the Internet.

The 'Reconnect on Internet access' function is enabled by default.

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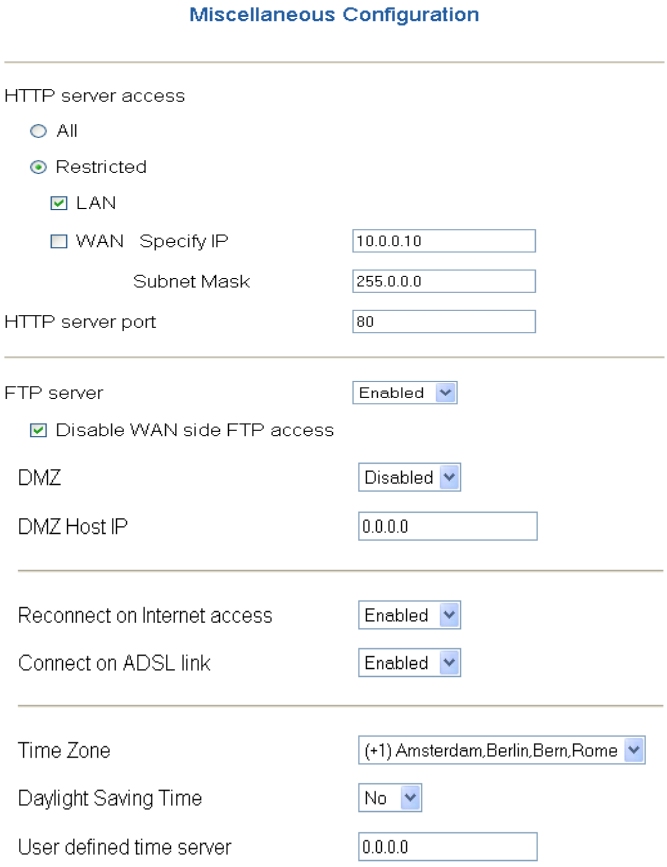
Miscellaneous



- 'HTTP server access': Controls access to the configuration pages:
  - 'All': If this function is enabled, the configuration pages will be accessible from both the WAN and the LAN.
  - 'Restricted/LAN': If this function is enabled, the configuration pages will be accessible from the LAN only.
  - 'Restricted/WAN': If this function is enabled, the configuration pages will be accessible from the WAN only. In this case, also enter the 'WAN Specify IP' and the 'Subnet Mask'.
- 'HTTP server port': The HTTP server port is set to '80' by default.

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Permitting WAN-side access to the configuration pages is a major security risk.

- 'FTP server': here you can switch the FTP server on and off.

The 'Disable WAN side FTP access' function is enabled by default.

- 'DMZ' (Demilitarized Zone): This function is a DMZ host. A DMZ host is a computer (server) running all Internet services such as Web, e-mail, FTP and game servers and is therefore directly connected to the Internet.
- 'DMZ Host IP': IP address of the DMZ host

Be aware of the security risks of setting up a computer in your local network as a DMZ host, as it can be misused for intrusion attempts from the Internet.

- 'PPP reconnect on Internet access': If you check this function, an Internet connection is automatically established whenever an application tries to send a data packet to the Internet.
- 'PPP connect on ADSL link': If this function is enabled, an Internet connection will be established anytime a physical ADSL connection is available.
- 'Time Zone': Select your time zone here.
- 'Daylight Saving Time': Select standard or daylight savings time here.
- 'User defined time server': IP address of the time server.

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3.3.5 Status

ADSL

Detailed information on the ADSL line is available under 'ADSL'.

ADSL Status

Showtime Firmware Version: **3.30**
Line State: **ACTIVATION**
Modulation: **N/A**
Annex Mode: **ANNEX_B**
Startup Attempts: **0**
Max Tx Power: **-38 dBm/Hz**
CO Vendor: **UNUSED_VENDOR_0**
Elapsed Time: **0** days **0** hours **33** minutes **33** seconds

	Downstream	Upstream	
SNR Margin	NA	NA	dB
Line Attenuation	NA	NA	dB
Errored Seconds	0	0	
Loss of Signal	0	0	
Loss of Frame	0	0	
CRC Errors	0	0	
Data Rate	0	0	kbps
Latency	NA	NA	

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PPP

Current protocol data is available under 'PPP'.

PPP Status

#	Connection Name	Interface	Mode	Status	Pkts Sent	Pkts Rcvd	Bytes Sent	Bytes Rcvd
1	PPPoPvc 0	Pvc 0	PPPoE	Not Connected	N/A	N/A	N/A	N/A

If a * appears under Mode column, you need to check the WAN configuration to make sure the VC has the correct encapsulation.

Connection # 1

Connect Execute

- 'Connection': Choice of configured Internet connection(s):
  - 'Connect/Disconnect': Click **Execute** to manually select ('Connect') a specific Internet connection or manually deselect it ('Disconnect').

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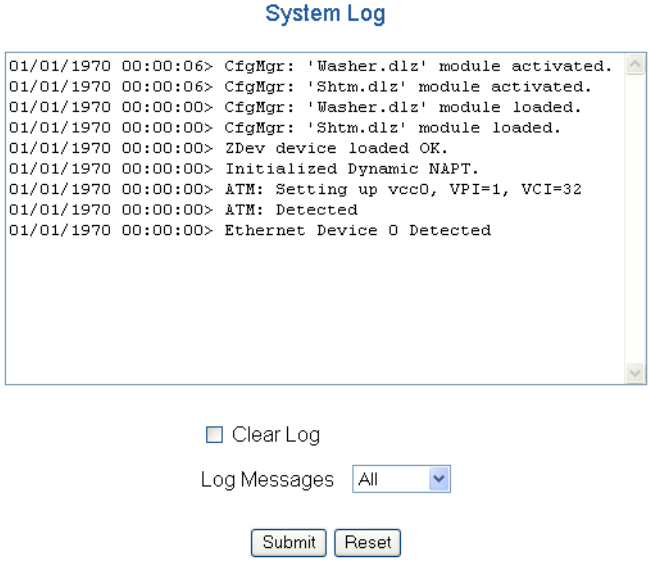
3.3.6 Tools

System Log

Under 'System Log', there is a log file which records the activities of your router. The log file can also be saved as a text file on any connected computer.

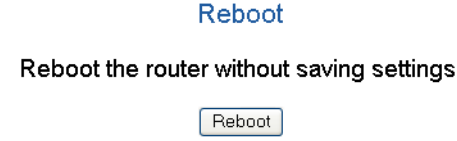

System Log
01/01/1970 00:00:06> CfgMgr: 'Washer.dlz' module activated.
01/01/1970 00:00:06> CfgMgr: 'Shtm.dlz' module activated.
01/01/1970 00:00:00> CfgMgr: 'Washer.dlz' module loaded.
01/01/1970 00:00:00> CfgMgr: 'Shtm.dlz' module loaded.
01/01/1970 00:00:00> ZDev device loaded OK.
01/01/1970 00:00:00> Initialized Dynamic NAPT.
01/01/1970 00:00:00> ATM: Setting up vcc0, VPI=1, VCI=32
01/01/1970 00:00:00> ATM: Detected
01/01/1970 00:00:00> Ethernet Device 0 Detected
Clear Log
Log Messages
All
Submit
Reset

- 'Clear Log': Select 'Clear Log' when all entries in the log are to be deleted.
- 'Log Messages':
  - 'All': Select 'All' to display all entries in the log file.
  - 'Events': Select 'Events' to display only events in the log file.
  - 'Warnings': Select 'Warnings' to display only warnings in the log file.

*Confirm your entries by clicking on **Submit**.*

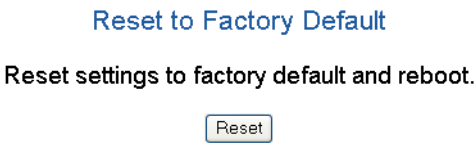
Reboot

Use 'Reboot' to restart the router from the configuration interface (rather than the power switch on the router itself) without saving your settings.



Reset to Factory Default

To reset the router to its factory defaults, select 'Reset to Factory Default' and confirm your choice with the **Reset** button, or press and hold the 'Factory Default' button on the rear panel of the MicroLink ADSL Modem Router briefly. This will restart the MicroLink ADSL Modem Router. Next, restart all of the connected computers.



The reset will discard your current settings, making it necessary to reconfigure the router.

Firmware Update

Once you have downloaded the new firmware from the Internet, open the menu of the MicroLink ADSL Modem Router, select 'Tools' and 'Firmware Update', and click **Prepare update**. The MicroLink ADSL Modem Router will now start in a special mode. Select **Browse** to locate the new firmware.

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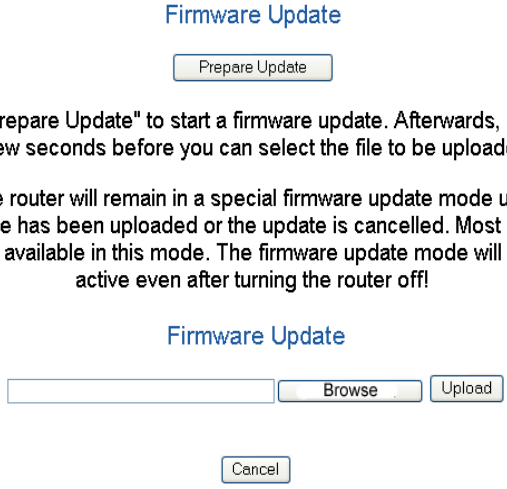
Next, click **Upload** to load the firmware or **Cancel** to interrupt the process. The router will restart automatically when the firmware update is complete.


Firmware Update
Prepare Update
Select "Prepare Update" to start a firmware update. Afterwards, it will take a few seconds before you can select the file to be uploaded.
Note: The router will remain in a special firmware update mode until either a firmware has been uploaded or the update is cancelled. Most functions are not available in this mode. The firmware update mode will remain active even after turning the router off!
Firmware Update
Browse
Upload
Cancel
Select the file to be uploaded or cancel the process.
Uploading the firmware can take up to a minute depending on your network speed. After the firmware has been uploaded, the router has to be restarted in order to program the new firmware. It is recommended to reset the router configuration after a successful firmware update.

The router switches into a special mode during firmware uploads; the ADSL module is disabled in this mode, for example. Configuration functions and Internet access are also disabled during this process. The router will remain in this mode—even if the power is switched off—until the new firmware has been successfully loaded or the update process canceled.

When the firmware update is complete, it is necessary to reset the router to its factory defaults by pressing the button on the rear panel of the device.

*When the router restarts, the 'Connect' LED will be lit for around 1 minute. Do **not** interrupt this process! Switching the MicroLink ADSL Modem Router off during this time can irreparably damage the router's firmware.*

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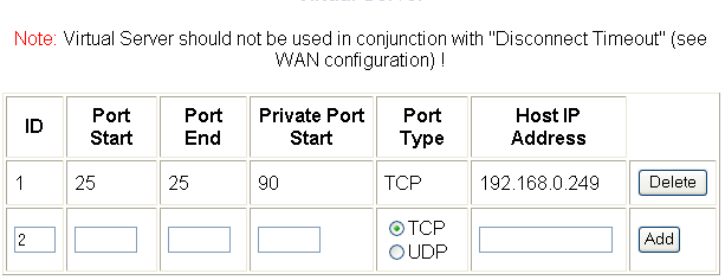
3.3.7 Advanced

These functions are advanced functions which have been preset for optimal use. Normally, it is not necessary to modify these settings.

Virtual Server

You can use 'Virtual Server' to activate (via IP address) a certain service (specified by port number) for specific local computers for direct access from the Internet (e.g. for web, FTP or e-mail servers). If you want to use this option, dynamic IP address assignment must be disabled on the particular computer, and a static IP address assigned.



- 'Port Start': Enter the WAN port number for the service, e.g. port 25 for e-mail.
- 'Port End': Enter the WAN port number for the service, e.g. port 25 for e-mail.
- 'Private Port Start': Enter the LAN port number for the service.

The port number in the LAN may differ from that in the WAN, i.e. within your local network, you can assign port numbers that are different to conventional WAN numbers. In such cases, the router simply diverts the service to the relevant port.

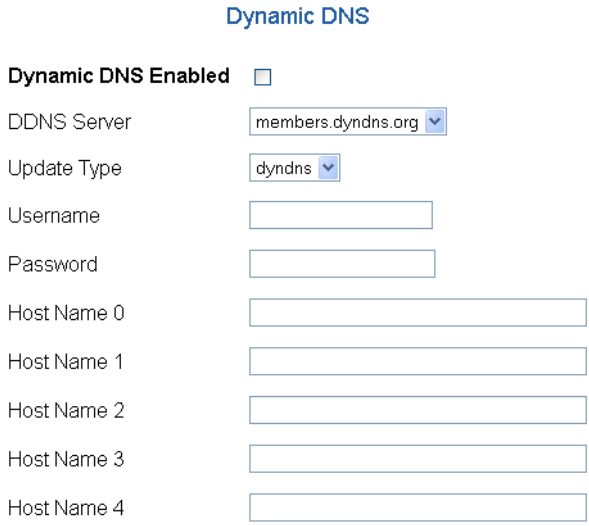
- 'Port Type': This is where you select the appropriate protocol, e.g. 'TCP'.
- 'Host IP Address': This is where you enter the IP address of your local server, e.g. 192.168.0.249.

*Confirm your entries by clicking on **Add**.*

DDNS

The **D**ynamic **D**omain **N**ame **S**ystem is an extension to DNS and controls the assignment of dynamic IP addresses for fixed host names (i.e. computer

names). New IP numbers as assigned by the ISP are automatically forwarded to the DDNS provider so that a plain-text name (e.g. www.devolo.com) is constantly available despite the varying IP address.



- 'Dynamic DNS Enabled': This is where you activate the DDNS function.
  - 'DDNS Server': Host name of the DDNS server.
  - 'Update Type': The is where you select the various DNS products 'static', 'dyndns' and 'custom'.

More information is available from www.dyndns.org.

  - 'Username': This is where you enter the user name given to you by your DDNS provider.
  - 'Password': This is where you enter the password given to you by your DDNS provider.
  - 'Host Name ...': Under host name 0 to 4 you enter each of the fixed computer names (e.g. www.example.dyndns.org).

Route Table

If there are multiple routers on your network, it is useful to set presets for the routing. The 'Route Table' contains the current routing data. The gateway

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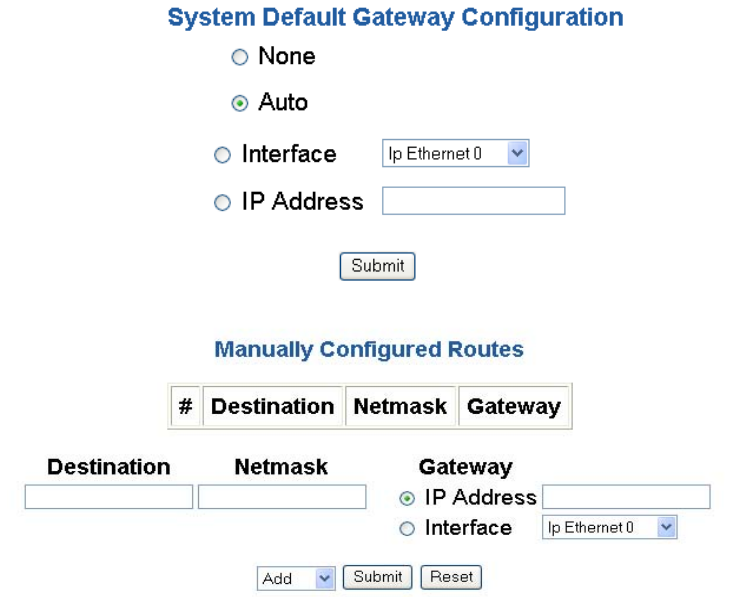
associated with the IP address ranges is also stored here. These settings can be modified while the WAN connection is active.

Route Table

Destination	Netmask	Gateway	Interface
192.168.0.0	255.255.255.0	192.168.0.253	br0
127.0.0.1	255.0.0.0	127.0.0.1	lo0



- 'System Default Gateway Configuration':
  - 'None': The router does not use a default gateway.
  - 'Auto': The router selects the gateway automatically.
  - 'Interface': The default gateway can be entered manually.
  - 'IP Address': IP address of the gateway (or router).
- 'Manually Configured Routes':
  - 'Destination': IP address of the destination network.
  - 'Netmask' of the destination network.

- 'Gateway': 'IP Address' of the next router over which the destination network can be reached.
- 'Interface' is the interface over which the target network can be reached.

PPP Disconnect Timeout

Use 'PPP Disconnect Timeout' to define filters for the idle time. These filters can be used to accept or discard certain data packets.

The idle time function (default setting: '5') lets you set a time limit so that you can control your connection charges and reduce costs based on time. If the router does not receive any admitted data packets for the amount of time specified by the idle time setting, it automatically disconnects from the Internet server. As soon as it receives a request to connect after disconnecting auto-

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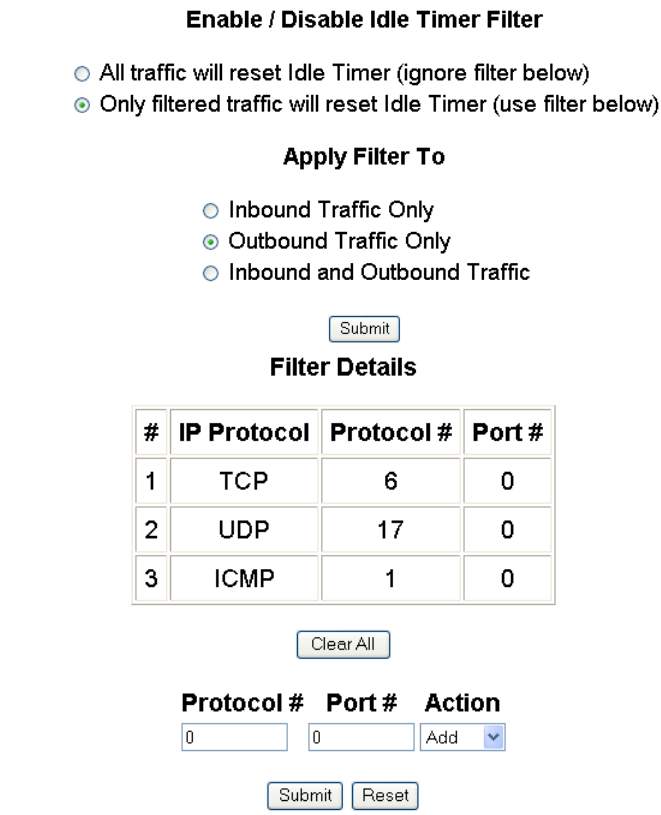
matically, it automatically reestablishes a connection (if you have enabled the option 'Reconnect on Internet access').

PPP Disconnect Timeout


Enable / Disable Idle Timer Filter
All traffic will reset Idle Timer (ignore filter below)
Only filtered traffic will reset Idle Timer (use filter below)
Apply Filter To
Inbound Traffic Only
Outbound Traffic Only
Inbound and Outbound Traffic
Submit
Filter Details
IP Protocol Protocol # Port
1 TCP 6 0
2 UDP 17 0
3 ICMP 1 0
Clear All
Protocol # Port # Action
0 0 Add
Submit Reset

- 'Enable/Disable Idle Time Filter':
  - If the 'All traffic will reset Idle Timer (ignore filter below)' option is enabled, **no** filters will be applied when establishing the Internet connection.
  - If the 'Only filtered traffic will reset Idle Timer (use filter below)' option is enabled, the configured filters will be applied when establishing the Internet connection.
- 'Apply Filter To': Specify the data to be filtered here.

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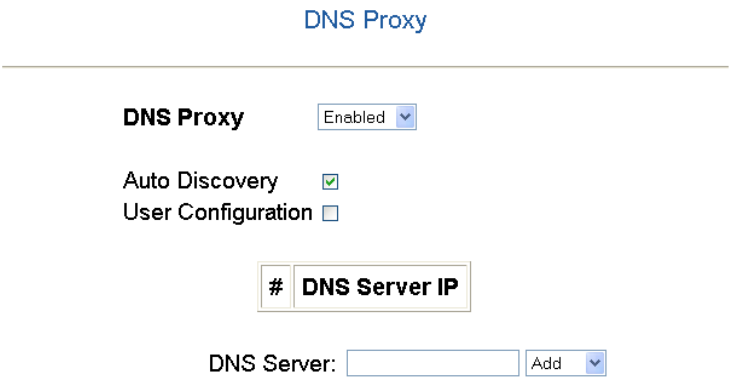
- 'Inbound Traffic Only'
- 'Outbound Traffic Only' or
- 'Inbound and Outbound Traffic'.

- 'Filter Details': Define the filters at the protocol level here by specifying a protocol and a port. Select the appropriate 'Action' to add or remove a protocol. The following protocols have been preset:
  - TCP protocol with number 6
  - UDP protocol with number 17
  - ICMP protocol with number 1

The default setting for the idle time filters (see illustration) is optimal for most applications. Please note: By permitting incoming data, your configured idle time will virtually never elapse due to random incoming data packets. If you have flat-rate service from your Internet provider (unlimited online time without additional charges), you obviously do not have to worry about such "inadvertent" connections to the Internet. However, if your Internet connection is billed by connection time, we recommend keeping the default setting for the idle time filter.

DNS Proxy

The **D**omain **N**ame **S**ervice protocol converts Internet names (also called URL addresses, e.g. www.british-telecom.co.uk) into IP addresses (e.g. 212.184.6.56).



- 'DNS Proxy': Select 'Enabled' to use the DHCP proxy.
- Select 'Auto Discovery' to use the DNS addresses provided when establishing the Internet connection.

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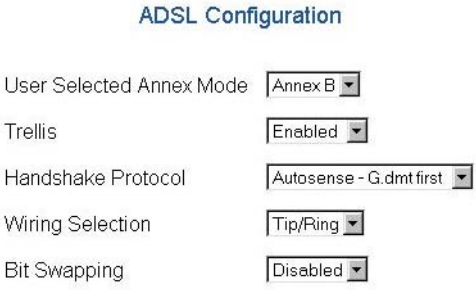
- Select 'User Configuration' to use DNS addresses you have entered manually.
  - 'DNS Server IP': When specifying settings, enter the IP address(es) of your Internet provider's DNS server(s) in the 'DNS Server' field, click 'Add' and confirm with **Submit**.

ADSL configuration

Settings for the ADSL protocols can be defined under 'ADSL configuration'.



- 'User Selected Annex Mode': Annex A or Annex B, depending on the standard of your ADSL provider.
- 'Trellis': the trellis process subtracts transmitted data from the signal mix for echo cancellation and filters out received information. This complex process improves the signal-to-noise ratio of the connection for an enhanced data rate. Support by your ADSL carrier is required in order to take advantage of the trellis process.
- 'Handshake Protocol': communication protocol that governs data flow between the computer and router.
- 'Wiring Selection': connection type of the ADSL cable.
- 'Bit Swapping': bit swapping refers to the adaptation of bit distribution in the various subchannels (sub-carriers) during ongoing operation. The communication speed is adjusted to match the performance of the channel without interrupting the data flow. The number of bits varies according to the intensity of the signal and noise.

For further information, please visit our website at www.devolo.com or refer to the included devolo product CD.

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4 Appendix

4.1 Performance data and specifications

	MicroLink ADSL Modem Router
LAN standards	Ethernet specification IEEE 802.3 Fast-Ethernet specification IEE 802.3u Full duplex specification IEEE 802.3x
ADSL standard	ADSL over ISDN ITU G.992.1 (G.dmt, Annex B) Telekom specification (U-R2) ADSL over POTS ANSI T1.413 Issue 2 ITU G.992.1 (G.dmt, Annex A) ITU G.992.2 (G.lite)
Transfer throughput	Download up to 8 Mbps, Upload up to 1 Mbps
Diagnostics support	ADSL status table PPP status table System log table Routing table
Ports	4 LAN with Auto MDI-X (LAN ports can also be used as uplink ports) 1 ADSL connection
WAN connection	Connection type: RJ 11
LEDs	Power 4x3 status LEDs for Ethernet ports and uplink ports 3 WAN status
Computer interface	RJ45
Protocols	PPP over Ethernet (RFC 2516) PPP over ATM (RFC 2364) IP over ATM: Bridged Ethernet/Routed IP (RFC 2225/2684) Classical IP over ATM (RFC 1577) ATM AAL 5 Supports VPN Pass-Through (PPTP)
System requirements	Computer with network-enabled operating system with a Web browser, such as Windows 98, Windows Me, Windows 2000, Windows XP, Linux, MAC OS X and an Ethernet port (RJ45) For Internet access: ADSL connection from by Internet access provider
Power supply	9 V AC/800 mA adapter

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	MicroLink ADSL Modem Router
Ambient conditions	0–40°C, 10–90% humidity (non-condensing)
CE conformity	CE conformity in accordance with the technical requirements for all EU countries and Switzerland EN60950 EN55022 EN55024
Warranty	3 years

4.2 Care and maintenance of the device

There are no user-serviceable parts inside the case. Do not open the case.

Clean the unit by wiping dirt from the case using an eyeglasses cleaning cloth or other soft cloth. Never use water, paint thinner, benzene, alcohol or other strong cleaning agents when cleaning the MicroLink ADSL Modem Router, as these could damage the case.

4.3 CE conformity

CE

The product conforms to the basic requirements of Directive 1999/5/EC (R&TTE) and the other relevant provisions of the FTEG (Radio and Telecommunications Terminal Equipment Act), and is designed for use in the EU and Switzerland.

This product is class A equipment. This equipment may cause interference with radio waves in home use; if this occurs the operator may be required to take corrective action.

4.4 Declaration of conformity

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CE

KONFORMITÄTSERKLÄRUNG

gemäß dem Gesetz über Funkanlagen und Telekommunikationsendeinrichtungen (FTEG) und der Richtlinie 1999/5/EG (R&TTE)

EC DECLARATION OF CONFORMITY
appropriate to the law of radio and telecom terminalequipment and Directive 1999/5/EC (R&TTE)

Die Firma: **devolo AG**
The Company: **Sonnenweg 11**
52070 Aachen

erklärt, dass das Produkt: **MicroLink® ADSL Modem Router**
declares that the product:

Verwendungszweck: **ADSL-zu-Ethernet-Router**
Intended purpose: ADSL-to-Ethernet router

den grundlegenden Anforderungen des § 3 und den übrigen einschlägigen Bestimmungen des FTEG (Artikel 3 der R&TTE) entspricht.
complies with the appropriate essential requirements of the FTEG (Article 3 of R&TTE) and the other relevant provisions.

Harmonisierte Normen: Gesundheit und Sicherheit gemäß §3 (1) 1. (Artikel 3 (1) a))
Harmonised standards: Health and safety requirements contained in §3 (1) 1. (Article 3 (1) a))

EN 60 950: 1992 +A1: 1993 +A2: 1993 +A3: 1995 +A4: 1997 +A11: 1997

Harmonisierte Normen: Schutzanforderungen in Bezug auf die EMV §3 (1) 2, (Artikel 3 (1) b)
Harmonised standards: Protection requirements with respect to EMC §3 (1) 2, (Article 3 (1) b)

EN 55 022: 1998 Class B +A1: 2000
EN 55 024: 1998

Diese Erklärung wird verantwortlich abgegeben durch:
This declaration is submitted by:

Aachen, 26. September 2002
Aachen, 26th September 2002

Heiko Harbers
Vorstandsvorsitzender
CEO

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4.5 Warranty conditions

The devolo AG warranty is given to purchasers of devolo products in addition to the warranty conditions provided by law and in accordance with the following conditions:

1 Warranty coverage

a) The warranty covers the equipment delivered and all its parts. Parts will, at devolo's sole discretion, be replaced or repaired free of charge if, despite proven proper handling and adherence to the operating instructions, these parts became defective due to fabrication and/or material defects. Alternatively, devolo reserves the right to replace the defective product with a comparable product with the same specifications and features. Operating manuals and possibly supplied software are excluded from the warranty.

b) Material and service charges shall be covered by devolo, but not shipping and handling costs involved in transport from the buyer to the service station and/or to devolo.

c) Replaced parts become property of devolo.

d) devolo is authorized to carry out technical changes (e.g. firmware updates) beyond repair and replacement of defective parts in order to bring the equipment up to the current technical state. This does not result in any additional charge for the customer. A legal claim to this service does not exist.

2 Warranty period

The warranty period for this devolo product is three years. This period begins at the day of delivery from the devolo dealer. Warranty services carried out by devolo do not result in an extension of the warranty period nor do they initiate a new warranty period. The warranty period for installed replacement parts ends with the warranty period of the device as a whole.

3 Warranty procedure

a) If defects appear during the warranty period, the warranty claims must be made immediately, at the latest within a period of 7 days.

b) In the case of any externally visible damage arising from transport (e.g. damage to the housing), the person carrying out the transportation and the sender should be informed immediately. On discovery of damage which is not externally visible, the transport company and the sender are to be immediately informed in writing, at the latest within 3 days of delivery.

c) Transport to and from the location where the warranty claim is accepted and/or the repaired device is exchanged, is at the purchaser's own risk and cost.

d) Warranty claims are only valid if a copy of the original purchase receipt is returned with the device. devolo reserves the right to require the submission of the original purchase receipt.

4 Suspension of the warranty

All warranty claims will be deemed invalid

a) if the label with the serial number has been removed from the device,

b) if the device is damaged or destroyed as a result of acts of nature or by environmental influences (moisture, electric shock, dust, etc.),

c) if the device was stored or operated under conditions not in compliance with the technical specifications,

d) if the damage occurred due to incorrect handling, especially to non-observance of the system description and the operating instructions,

e) if the device was opened, repaired or modified by persons not contracted by devolo,

f) if the device shows any kind of mechanical damage, or

g) if the warranty claim has not been reported in accordance with 3a) or 3b).

5 Operating mistakes

If it becomes apparent that the reported malfunction of the device has been caused by unsuitable hardware, software, installation or operation, devolo reserves the right to charge the purchaser for the resulting testing costs.

6 Additional regulations

a) The above conditions define the complete scope of devolo's legal liability.

b) The warranty gives no entitlement to additional claims, such as any refund in full or in part. Compensation claims, regardless of the legal basis, are excluded. This does not apply if e.g. injury to persons or damage to private property are specifically covered by the product liability law, or in cases of intentional act or culpable negligence.

c) Claims for compensation of lost profits, indirect or consequential detriments, are excluded.

d) devolo is not liable for lost data or retrieval of lost data in cases of slight and ordinary negligence.

e) In the case that the intentional or culpable negligence of devolo employees has caused a loss of data, devolo will be liable for those costs typical to the recovery of data where periodic security data back-ups have been made.

f) The warranty is valid only for the first purchaser and is not transferable.

g) The court of jurisdiction is located in Aachen, Germany in the case that the purchaser is a merchant. If the purchaser does not have a court of jurisdiction in the Federal Republic of Germany or if he moves his domicile out of Germany after conclusion of the contract, devolo's court of jurisdiction applies. This is also applicable if the purchaser's domicile is not known at the time of institution of proceedings.

h) The law of the Federal Republic of Germany is applicable. The UN commercial law does not apply to dealings between devolo and the purchaser.